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Antenna list all previous and new antennas

MPE calculation for highest gain antenna for this report

New antenna specification sheets and or photographs

Intermec Technologies Corporation
 EMC Test Laboratory
 DOC. NO.: 577-501-360
 IM5 RFID Radio, FCC 15.247, Canada RSS-210, RSS-102
 Appendix B, RF Exposure, Antenna List, MPE Calculation

IM5 915 MHz RFID Antenna Summary

Intermec Part #	Vendor	Vendor Part #	Type	Polarization	Gain dBi linear	Cable Length	Cable Loss (dB)	Connector	Dimensions
Original Grant 12/2/2004									
805-609-001	Cushcraft	SP9028C	Patch	CP	4	156"	N/A	SMA(RP)	10.2" x 10.2" x 1.5"
A270001-02	Sinclair	SRL-441U	Log	LP	7	N/A	2.4	N(RP)	11" x 5" x 8.5"
805-622-002	Kathrein	25-178	Patch	CP	6	N/A	2.4	N(RP)	10.2" x 25" x 2.3"
	Huber Suhner	SPA 915/65/8/0/DCP	Panel	CP	5	N/A	2.4	N(RP)	21" x 14" x 1"
715-363-001	Intermec	715-363-001, (ITA915017)	Patch	LP	-5.4	N/A	2.4	N(RP)	8" x 6" x 2"
C2PC 12/23/2005									
805-622-002	Kathrein	25-178	Patch	CP	6.5	N/A	2.4	N(RP)	10.2" x 25" x 2.3"
805-629-001	Mobile Mark	PN10-915RCPI	Patch	CP	7	N/A	2.4	N(RP)	12.25" jx 12.25" x 3.5"
805-623-002	Kathrein	25-277	Patch	CP	5.5	N/A	2.4	N(RP)	10.2" x 15.4" x 2.3"
805-609-001	Cushcraft	SP9028C	Patch	CP	4	156"	N/A	SMA(RP)	10.2" x 10.2" x 1.5"
805-626-001	Kathrein	25-578	Patch	LP	6	N/A	2.4	N(RP)	6.1" x 13.4" x 1.9"
805-610-001	Maxrad	MP8906	Patch	LP	8	60"	2.2	N(RP)	8.6" x 7.8" x 2.3"
A270001-02	Sinclair	SRL-441U	Log	LP	7	N/A	2.4	N(RP)	11" x 5" x 8.5"
1-206589-00	Intermec	1-206589-00	Patch	LP	-3.4	23"	N/A	MMCX	4.5" x 0.75" x 0.4"
C2PC Rpt 8/29/2006									
805-644-001	Huber Suhner	SPA 915/63/9/0/RCP_C	Panel	CP	5.5	N/A	2.4	N(RP)	12" x 12" x 1"
805-644-002	Huber Suhner	SPA 915/63/9/0/LCP_C	Panel	CP	5.5	N/A	2.4	N(RP)	12" x 12" x 1"
805-654-001	Huber Suhner	SPA 915/60/10/0/RCP_C	Panel	CP	7	N/A	2.4	N(RP)	14.5" x 14.5" x 1"
805-654-002	Huber Suhner	SPA 915/60/10/0/LCP_C	Panel	CP	7	N/A	2.4	N(RP)	14.5" x 14.5" x 1"
	Mobile Mark	BP6-915LCP	Patch	CP	2.5	N/A	2.4	SMA(RP)	5.75" x 5.75" x 0.7"
	Mobile Mark	EDN#241	Patch	LP	3	N/A	2.4	SMA(RP)	3.5" x 3.5" x 0.9"
805-816-002	Cushcraft	SP9026C_Spec?	Patch	CP	3	N/A	2.4	N(RP)	7" x 7" x 2"
	Mobile Mark	DLM3-915RS	Patch	LP	3	N/A	2.4	SMA(RP)	4.52" dia x 1"
1-971040-001	Intermec	1-971040-001	Patch	LP	-34	N/A	N/A	MMCX	2.325" x 0.75" x 0.063"

MAXIMUM PERMISSIVE EXPOSURE, MPE CALCULATOR

IM5 / IF4 RFID 900 MHz Reader

with 7 dBi antenna, Intermec PN 805-654-001

Huber Suhner Model SPA 915/60/10/0/RCP_C

MPE Calculator				dBi	7.00
				dBi to dBd	2.17
TX Frequency (MHz)	902	Watts	1	Antenna Gain dBd	4.83
Cable Losses dB	2	dBm	30.000000	Antenna minus cable = dBd	5.00
		Calculated ERP (mW)	1918.668741	radiated (ERP) dBm	32.830
		Calculated EIRP (mW)	3162.277660	radiated (EIRP) dBm	35.000

Occupational Limit
3.007 mW/cm²

General Public Limit
0.6013 mW/cm²

$$\frac{\text{EIRP}}{4 \uparrow d^2} = \text{mw/cm}^2$$

TX Frequency (MHz)	
wavelength	
meters	cm
0.332594235	33.259

d = cm EIRP=mW

FCC radiofrequency radiation exposure limits 1.1310			
Freq. MHz	occ.limit		public limit
300-1,500	f/300		f/1500
1,500-10,000	5		1

MPE uses EIRP for calculations. EIRP is based on TX power added to the antenna gain in dBi.
 dBi = dB gain compared to an isotropic radiator

* The 23 cm safe distance is currently shown on the IM5 Grant

*

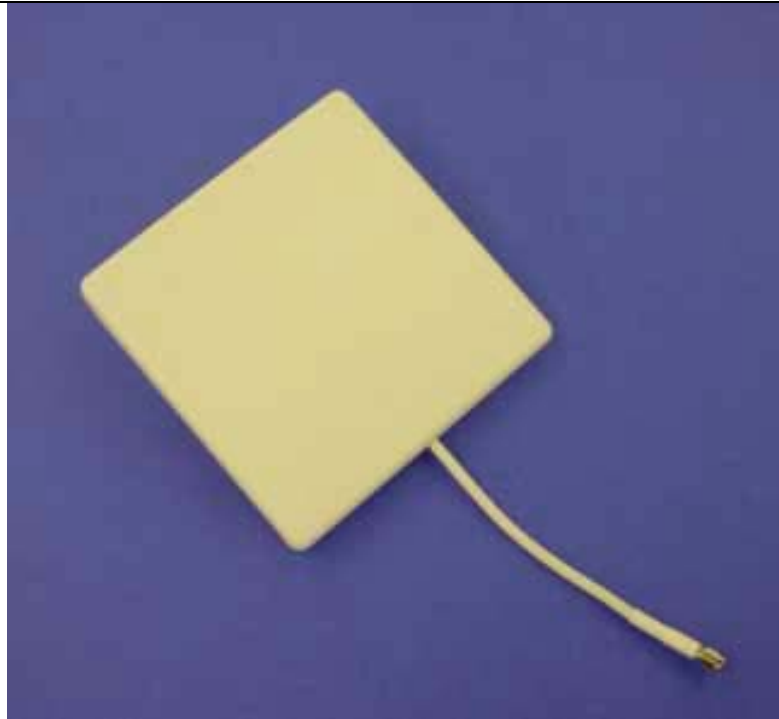
EIRP (watts)	Distance (cm)	Distance (Meters)	Distance (inches)	mW/cm ²
3162.278	100.00	1.0000	39.37	0.02516
3162.278	75.00	0.7500	29.53	0.04474
3162.278	50.00	0.5000	19.69	0.10066
3162.278	40.00	0.4000	15.75	0.15728
3162.278	35.00	0.3500	13.78	0.20543
3162.278	30.00	0.3000	11.81	0.27961
3162.278	29.00	0.2900	11.42	0.29922
3162.278	24.00	0.2400	9.45	0.43689
3162.278	23.00	0.2300	9.06	0.47570
3162.278	22.00	0.2200	8.66	0.51993
3162.278	21.00	0.2100	8.27	0.57063
3162.278	20.50	0.2050	8.07	0.59880
3162.278	20.00	0.2000	7.87	0.62912
3162.278	19.50	0.1950	7.68	0.66179
3162.278	19.00	0.1900	7.48	0.69708
3162.278	18.50	0.1850	7.28	0.73527
3162.278	18.00	0.1800	7.09	0.77669
3162.278	17.50	0.1750	6.89	0.82170
3162.278	17.00	0.1700	6.69	0.87075
3162.278	16.50	0.1650	6.50	0.92432
3162.278	16.00	0.1600	6.30	0.98299



805-654-001, -002 Huber Suhner SPA915/63/9/0/RCP or LPC 6 dBi Linear Gain
12”sq. x 1”



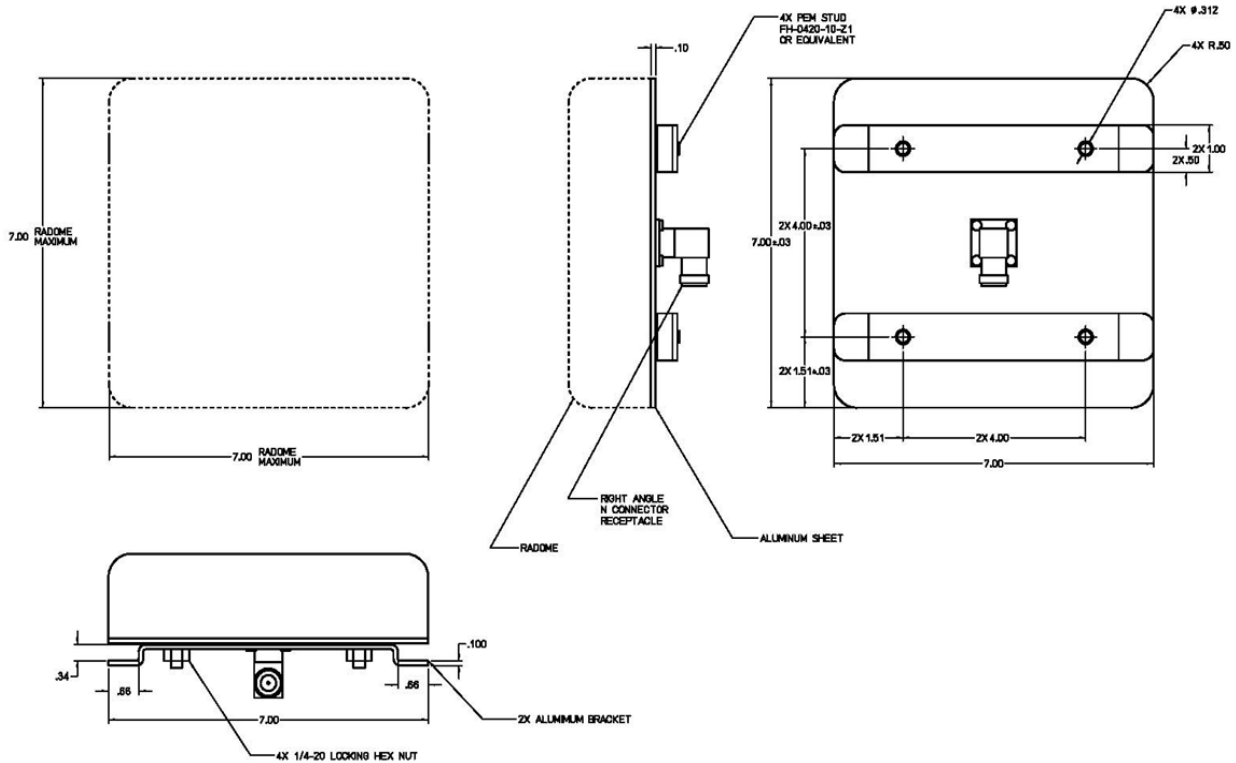
805-644-001, -002 Huber Suhner SPA915/60/10/0/RCP or LPC 7 dBi Linear Gain
14.5”sq. x 1”



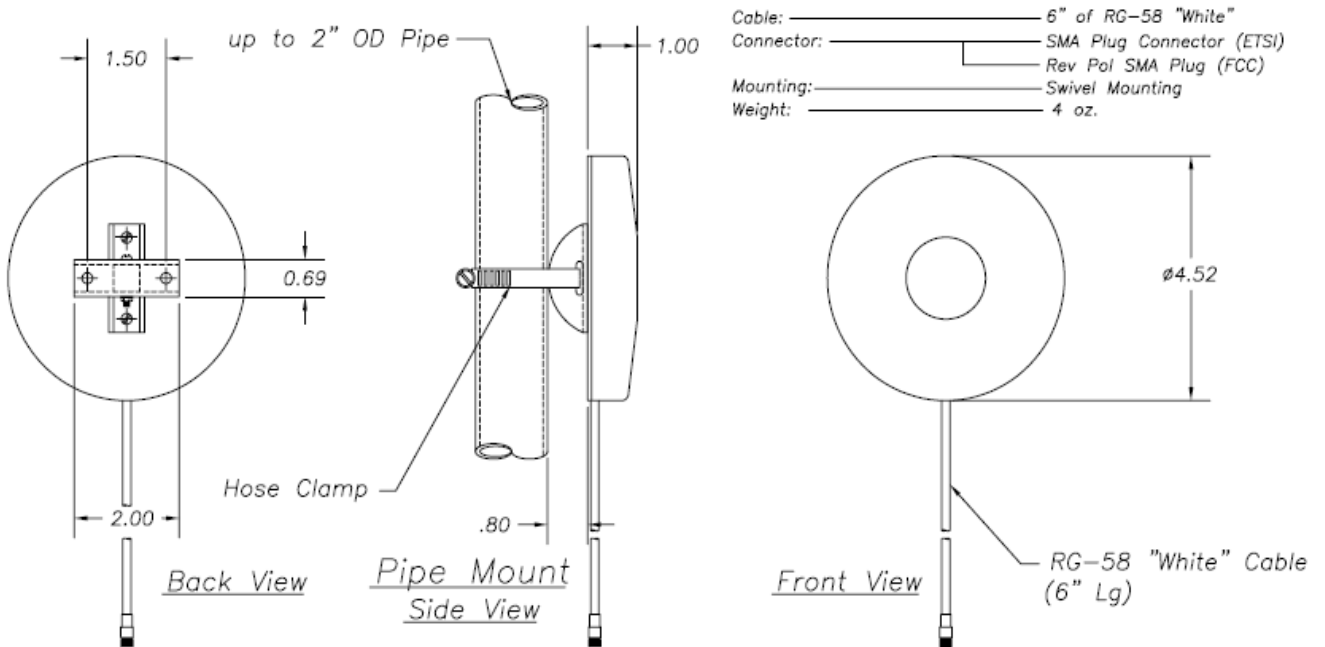
N/A Mobile Mark BP6-915 Patch LPC 2.5 dBi Linear Gain
5.75"sq. x 0.7"



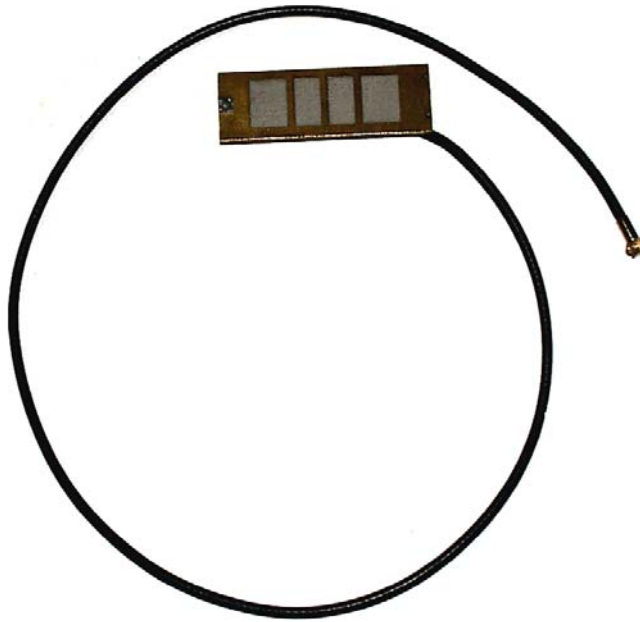
N/A Mobile Mark EDN#241 Patch 3 dBi Linear Gain
3.5"sq. x 0.9"



805-816-002 Cushcraft SP9026C _Spec? Patch 3 dBi Linear Gain
 7"sq. x 2.0"



N/A Mobile Mark DLM-915RS Patch LP 3 dBi Linear Gain
 4.5" dia x 1"



1-971040-001 Intermec Patch -34 dBi Linear Gain
2.325" x 0.75" x 0.063"